IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF MARYLAND

UNITED STATES :

:

:

v. : Case No. RDB-19-0398

:

COLLIN DAVIS

:

Defendant

MEMORANDUM IN SUPPORT OF MOTION IN LIMINE TO LIMIT THE EXPERT TESTIMONY AND CELLULAR ANALYSIS REPORT OF SPECIAL AGENT MATHEW J. WILDE AND REQUEST FOR DAUBERT HEARING

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INTRODUCTION

Cell phones have become an integral part of everyday life in the United States. The overwhelming majority of Americans currently own a cell phone. Recent studies estimate that as many as 97% of the general population of the United States own one of these devices. *See* "Mobile Fact Sheet" located at https://www.pewresearch.org/internet/fact-sheet/mobile/. (last accessed May 5, 2021). Cell phones have become increasingly complex, storing more data and performing more functions than ever before. The smart phones of today can perform functions that were once reserved for desktop computers. For many, their cell phone is there personal computer ("PC"). Because of the influx in ownership, coupled with the amount of functions cell phones perform, they have quickly morphed from a luxury into a necessity of everyday life.

It logically follows that the more functions that a cell phone performs, the more data it stores. Almost all data, within limitations, is stored within the phone itself. Much of this data is recorded by the cell phone providers themselves. This data can provide intimate details of the phone's past usage, which in turn can give intimate details about the user of the phone. It is for this very reason that Fourth Amendment privacy protections have extended to searches of cell phones, such as was recognized by the Court in *Riley v. California*, 573 U.S. 373 (2014) and *Carpenter v. United States*, 138 S.Ct. 2206 (2018). Because of the privacy issues at stake, digital evidence from cell phones should be carefully scrutinized before its introduction against a defendant during a criminal prosecution.

The vast amounts of data collected by cell phones and/or the cellular service providers (e.g. Verizon, Sprint, or T-Mobile), can be utilized to try to hypothesize the location of a cell phone. There are three specific methods to hypothesize the location of a cell phone them:Global Positioning System ("GPS"), real-time triangulation and historical cell-site data. Analysis of

historical cell-site data, the method most utilized by law enforcement and used in the instant matter, is by far the least reliable.

Historical cell-site location analysis is a method by which the location of a specific cell phone is hypothesized based on which cell tower connected the cell phone to the cellular network at a given time. Douglas Starr, *What your cell phone can't tell the police*, New Yorker (June 26, 2014), located at https://www.newyorker.com/news/news-desk/what-your-cell-phone-cant-tell-the-police (last accessed May 5, 2021) (hereinafter "Starr Article"). This analysis is first conducted by a review of Call Detail Records ("CDRs") specific to the cell phone being investigated. CDRs contain information about the numbers that were called from a particular cell phone, the duration of the call, the date and time of the calls, and the cell site information for cell phones. Larry E. Daniel & Lars E. Daniel, DIGITAL FORENSICS FOR LEGAL PROFESSIONALS: UNDERSTANDING DIGITAL EVIDENCE FROM THE WARRANT TO THE COURTROOM (2012). The cell-site or cell tower location information contained in CDRs is extremely imprecise, forcing an "expert" witness for the government to hypothesize on the possible location of a phone within a geographic area serviced by a cellular network.

"Rather than pinpoint a suspect's whereabouts, cell-tower records can place a phone within an area of up to several hundred square miles, or in a congested urban area, several square miles." Starr Article. In the absence of any location stated in the CDRs, a prospective expert would have to guess the location of an individual's phone by comparing the historical cell tower connection data with locations of cell towers in the area. *Carpenter*, 138 S. Ct. at 2212-13. The witness would then proffer an opinion to the jury concerning the location of a given cell phone based solely upon the cell tower the phone connected to during a given call, despite that cell tower being able to service potentially hundreds of square miles. "The paradigm is the assumption that, when you

make a call on your cell phone, it automatically routes to the nearest cell tower, and that by capturing those records, police can determine where you made a call – and thus where you were – at a particular time. That . . . is not how the system works. *See* Starr Article.

This method of hypothesizing the whereabouts of a phone, thus implicating an associated user of that phone, is neither accurate nor reliable under the relevant legal standards. It is this category of unreliable information that the government seeks to introduce as it's strongest corroboration of its theory that Mr. Davis committed the offense conduct underlying this prosecution.

Defense counsel anticipates that the government's proffered expert, Special Agent Mathew Wilde, plans to opine that, based on his analysis of call detail records produced by the cellular service provider, that Mr. Davis was in the vicinity of the alleged carjacking and homicide on September 25, 2018. Special Agent Wilde's opinions and his related demonstrative exhibits are based on CDRs, which are not a reliable means by which to pinpoint the location of a cell phone. Furthermore, Special Agent Wilde's testimony is ripe for misinterpretation and overreliance by the jury. Accordingly, the Court should preclude Special Agent Wilde from testifying.

In the event this Court were inclined to allow Special Agent Wilde to testify regarding the historical cell site location information, his opinion and demonstratives are based upon partial information that was carefully chosen to support the government's theory. This information has questionable relevance considering it is based solely on the hypothesis of the expert alone and cannot ever pinpoint the location of the phone in question. Thus, the testimony of Special Agent Wilde's should be limited in three distinct ways, should this Court permit his qualification as an

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¹ Expert Disclosures sent to defense counsel do not explicitly state Special Agent Wilde's proffered opinion, thus do not comport with the requirements of Federal Rule of Criminal Procedure 16.

expert for the anticipated purposes: 1) the Court should preclude Special Agent Wilde from opining on Mr. Davis's location, as opposed to the location of the phone; 2) the Court should preclude the government from relying on Special Agent Wilde's proffered demonstrative exhibits, which include incomplete and misleading information; and 3) the Court should impose the limitations imposed by Judge Grimm in *United States v. Medley*, to ensure the jury understands the inherent limitations of historical cell-site location analysis. 312 F. Supp. 3d 493, 503 (D. Md. 2018).

FACTUAL AND LEGAL BACKGROUND

I. Rule 702 and *Daubert* Mandate Comprehensive Evaluation of the Reliability of Particular Methodologies Underlying Expert Opinion Testimony.

Federal Rule of Evidence 702 governs the admissibility of expert testimony. Expert testimony is only appropriate when it concerns "scientific, technical, or other specialized knowledge" that will "assist the trier of fact to understand the evidence or to determine a fact in issue . . ." See Fed. R. Evid. 702; see also See Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 589 (1993); accord Kumho Tire v. Carmichael, 526 U.S. 137, 141 (1999) (same analysis applies to matters of a technical, rather than a scientific expertise). The latter condition "goes primarily to relevance." Daubert, 509 US at 591. "Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful." Id. (citing 3 Weinstein & Berger 702[02], p. 702–18.) "An additional consideration under Rule 702—and another aspect of relevancy—is whether expert testimony proffered in the case is sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute." United States v. Downing, 753 F.2d 1224, 1242 (3rd Cir. 1985).

Additionally, the witness must qualify as an expert from "knowledge, skill, experience, training or education." Fed. R. Evid. 702. The testimony of a proffered expert may take the form

of "an opinion or otherwise" if the testimony is "based upon sufficient facts or data," is produced from "reliable principles and methods" and the expert has "applied the principles and methods reliably to the facts of the case." *Id.* "Nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert." *Kumho Tire*, 526 U.S. at 158 (citing *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997)). The underlying purpose of Rule 702 is to engage the trial judge in the vitally important gate-keeping function to exclude expert or limit expert testimony that is either unreliable or unhelpful. Fed R. Evid. 702 advisory committee's note; *see also Kumho Tire*, 526 U.S. at 152 ("The objective of that requirement is to ensure the reliability and relevancy of expert testimony. It is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.")

Reliability is thus the touchstone of admissibility under *Daubert*. *Daubert*, 509 U.S. at 589; *see also United States v. Crisp*, 324 F.3d 261, 268 (4th Cir. 2003). Indeed, because of the power of expert testimony to sway a jury, "it is crucial that the district court conduct a careful analysis into the reliability of the expert's proposed opinion. In assessing the reliability of a particular methodology, the *Daubert* Court set forth five factors to consider:

- (1) whether the particular scientific theory "can be (and has been) tested";
- (2) whether the theory "has been subjected to peer review and publication";
- (3) the "known or potential rate of error";
- (4) the "existence and maintenance of standards controlling the technique's operation"; and
- (5) whether the technique has achieved "general acceptance" in the relevant scientific or expert community.

United States v. Hassan, 742 F.3d 104, 130 (4th Cir. 2014); *see also Daubert*, 509 U.S. at 593–94. The list is not exhaustive. Trial courts retain broad latitude to use other factors to measure reliability. *Kumho Tire.*, 526 U.S. at 152. The proponent of the expert testimony at issue must satisfy the burden of proving that the proffered testimony meets these requirements. *Daubert*, 509 U.S. at 592 n.10

It logically follows that expert testimony on the subject matter of historical cell site location information evidence is inadmissible unless it is based on a method that is "scientifically valid" and that "properly can be applied to the facts in issue" in a particular case. *Daubert*, 509 U.S. at 589; *Kumho Tire*, 526 U.S. at 141. Here, the government has failed to meet that burden with Special Agent Wilde's proposed opinion. The government has not provided any meaningful methodology to support Special Agent Wilde's conclusions. The CDRs relied upon by Special Agent Wilde detail interactions between a cellular telephone alleged to belong to Mr. Davis and the cellular provider network. Without more, the CDRs cannot be utilized as a reliable means to determine the location of a phone that previously connected with the network.

Special Agent Wilde opining as to the location of a specific cell phone only utilizing CDRs would be based upon a strained hypothesis, at best. Absent some other indicia of a quantifiable methodology, his testimony cannot be based on sufficient facts or data and/or the testimony cannot be the product of reliable principles and methods. *See* Fed. R. Evid. 702; *see also Daubert*, 509 U.S. 579. Under Rule 104(a), this Court must determine as a threshold matter that the expert's testimony will be based upon sufficient facts. This is a safeguard to "insure that experts do not simply offer opinions that are conclusory. To allow otherwise is to permit speculation, which is not 'helpful' to the factfinder, and therefore not appropriate for testimony under Rule 702." Hon.

Joseph F. Murphy, Jr. & Hon. Paul W. Grimm, MURPHY & GRIMM'S COMPARATIVE GUIDE TO THE MARYLAND & FEDERAL RULES OF EVIDENCE p. 242 (2007).

II. As Courts Have Recently Recognized, Historical Cell-Site Location Analysis Cannot Discern the Specific Location of a Cell Phone at a Given Time.

An overview of cell phone technology better explains the shortcomings of the proposed testimony once the *Daubert* standard is applied. Whenever a cell phone makes or receives a call or text message, the phone communicates, via radio waves, with a cell tower, which exists in a fixed location. See Aaron Blank, The Limitations and Admissibility of Using Historical Cellular Site Data to Track the Location of A Cellular Phone, 18 RICH. J.L. & TECH. 3, 3 (2011). Each cell tower is divided into three sectors, usually an approximately 120-degree wedge, each containing an antenna. The area served by each tower/sector combination is referred to as a "cell," and towers are called "cell sites." *See* Exhibit A, Special Agent Mathew J. Wilde Cast Report at 6.



The center point of each sector is called the "azimuth." *See* Exhibit C, Envista Forensics: Digital Forensics Guide: Cell Phone Location and Tracking Forensics (2018) at 26; Scientific Working Group on Digital Evidence, Recommendations for Cell Site Analysis, Version 1.1 (September 25, 2017) at 11. The azimuth gives the direction of each sector in degrees, with zero being pointed directly North. *Id.*

A given cell site may communicate with a phone up to 35 miles away in rural areas with fewer obstructions. *Id.* at 30. In practice, the range is typically six miles in rural areas and three miles in urban areas. Matthew Tart, Iain Brodie, Nicholas Gleed & James Matthews, *Historical Cell Site Analysis- Overview of Principles and Survey Methodologies*, 8 DIGITAL INVESTIGATIONS 185, 186-87 (2012). Urban areas tend to have a smaller range because cell towers are typically located closer together to account for higher population density and/or cell phone usage. *See* Blank, *supra* at 3. The wide range of towers creates overlapping zones, which allows for two phones in the same location to connect to two (or more) different cell towers from the same exact location. Tart et al., *supra* at 186.

There are countless factors that can account for variations in a specific cell's coverage area:

Wireless network connectivity is influenced by many factors, including proximity to a cell site, physical obstacles and signal interference caused by circuit components or natural disturbances that can distort communications. For example, like other radio transmissions, wireless phone calls can be affected by severe weather, topographical features, or large structures or other objects between your phone and the nearest cell site. The locations where you cannot make or receive calls due to these limitations are sometimes referred to as 'dead zones.' Network capacity and architecture can also affect access for users. For example, you may hear a busy signal when a cell site has reached its maximum capacity. Dropped calls can occur when either too few or no cell sites are available in the area where you are traveling. A weakened signal from a cell site or a network failure to transfer the call to a new cell site can also lead to your call being dropped.

FCC, Understanding Wireless Coverage (2017), located at https://www.fcc.gov/consumers/guides/understanding-wireless-telephone-coverage-areas (last accessed May 5, 2021); see also Exhibit C at 30; Blank, supra at 7("First, the technical characteristics of cell sites may affect signal strength: (1) the number of sites available; (2) maintenance or repairs being performed; (3) height of the cell tower; (4) height above sea level; (5) wattage output; and (6) range of coverage. Second, technical characteristics of the antennas on cellular sites may affect signal strength, such as the number of antennas, the angle and direction

the antenna is facing, height of each antenna, and call traffic processed through each antenna. Third, technical characteristics of the phone, such as the wattage output and generation of the phone's broadband capability, may affect signal strength. Fourth, signal strength may depend upon environmental and geographical factors, including the weather, topography, and level of urban development. Finally, indoor or outdoor use of the phone may alter the strength of the signal") Because of the aforementioned factors, the coverage area for each tower and sector is not uniform.

Additionally, every cell tower is designed to cover a specific geographic area, which are also not uniform in size or shape or demand. Tart et al., *supra* at 186. In a perfect world, where geography and distribution of people and man-made structures are evenly divided, cell towers could easily be placed equal distances apart in a perfectly symmetrical pattern. Common sense would dictate that the world is far from an ideal place for cell phones to exist. The factors stated above all exist, impacting essentially every cell site in the country and world. The District of Maryland is no exception to this rule.²

Routinely, law enforcement experts regularly infer to juries that cell phones are designed (and only) connect to the closest cell tower. This assertion is patently false. *See* Paul Giannelli et al., Scientific Evidence, § 25.09 (Matthew Bender ed., 5th ed. 2017); *see also* Exhibit C; Starr *supra*. Cell phones are designed to connect to the cell tower with the strongest signal at the time, which is not necessarily the closest cell tower. *Id.* A seemingly infinite number of factors affect which cell tower is chosen by a cell phone during any given phone call. Different networks (e.g. Verizon, Sprint, T-Mobile) have their own, differing methods for tower selection. "[C]ell tower tracking of cell phone calls is not the most reliable method, as carriers will route a call to whichever

² See Exhibit C at 30 for a great illustration of different cell site coverage areas service the same general vicinity.

towers ensure the call does not 'drop' – which may be towers farther from the cellular device." Leonard Deutchman, The Case for Making Cell Phone Tracking Data Available at Trial, 29 CRIM. JUST. 22, 26 (2015). In sum, signal strength reigns supreme and there is no way to tell from the CDRs utilized from the government's proffered expert (Special Agent Mathew J. Wilde) why the specific cell tower was chosen by the cell phone at issue.

Cell phones are typically in range of multiple cell towers at any given time. This is especially true in urban areas where a higher density of towers exists to account for the increased needs of a larger population than in rural areas. Tart et al., *supra* at 186. Cell phones are designed to scan the cellular network several times per minute for the cell tower with the strongest signal. *Id.* Signal strength from respective cell towers will continuously vary based upon the myriad of factors referenced earlier. Cell phones not only constantly monitor the network for the strongest signal, it will select new cell towers, in the event another tower has a stronger signal at that precise moment. *Id.* This occurs whether or not the phone is being actively used in the moment. *Id.*

In the event that a cell phone is in motion while a call is in progress, the process detailed directly above continues. As stated previously, cell phones continue to scan the network for the strongest signal possible. In order to maintain the strongest possible signal, a cell phone will be "handed off" if another cell tower currently presents a stronger signal. *See* Shannon Jaekel, Comment, *Cell Phone Location Tracking: Reforming the Standard to Reflect Modern Privacy Expectations*, 77 La, L. Rev. 143 (2016)(" As a cell phone moves throughout the coverage area, it will periodically identify itself to cell towers within its vicinity. Once the cell phone has located nearby cell towers, the phone ranks these towers according to the strength of the signal and registers with the cell tower best equipped to process a call through its radio signal's strength. The registration process occurs continuously and automatically while the phone is turned on. When a

phone moves away from the originating cell site during a call, the call is "handed off" to a new tower.") Handoffs can occur when a cell phone barely moves (if at all). *See* Exhibit C at 45 ("A hand-off refers to the process of transferring an ongoing phone call from one cell tower to another cell tower because the phone is moving away from a cell tower, approaching a cell tower, or is in a position where the signal from the cell tower the phone is connected to is not as strong and high quality as the signal from another tower, even when the cell phone is not moving.") Again, strongest signal strength always reigns supreme and CDRs cannot ever detail the reasoning as to why that signal *appeared* strongest to the cell phone at issue.³

Cellular service providers, such as AT&T, Sprint, and Verizon, keep historical records of cell phone transmissions for their subscribers' phone numbers, commonly referred to as Call Detail Records or CDRs. CDRs contain information such as: time and date of specific calls, the phone numbers called, and the cell towers used to connect the call. Jaekel, *supra* at 148. Only information regarding actual connections to the cellular network (e.g. calls and texts) will be recorded, but not the innumerable times that a cell phone may be in range of a different cell tower or the cell tower in closest proximity to a particular cell phone. *See* Exhibit C. This information was never intended to be collected for the purpose of determining a phone's location, but for billing and system maintenance only. Jaekel, *supra* at 148. Now, the government is seeking to qualify an expert to utilize these same records for an unintended purpose in pursuit of satisfying the highest burden recognized under our law of jurisprudence: proof beyond a reasonable doubt.

Typically, an expert trained in cell-site location analysis will use the call detail records provided by a cell phone carrier to create a map of the towers and sectors used by a cell phone during voice calls or text messages to illustrate a phone's general location at the time of the call or

 $^{^3}$ Cell phones will likewise not connect to a tower undergoing maintenance or a system update.

text. See United States v. Medley, 312 F. Supp. 3d 493, 495 (D. Md. 2018). The locations of the towers used by a given cell phone do not indicate a precise location for the phone during the transmissions in question; nor do they indicate who was using the phone during any particular transmission. Scientific Working Group on Digital Evidence, Recommendations for Cell Site Analysis, Version 1.1 (September 25, 2017) at 14; Blank, supra at 7-9, 13; Exhibit C at 7. Rather, using the tower location and the sector information, the experts draw conclusions about the possible general vicinity of a phone during a particular communication or about movement of a phone over time, under the assumption that a phone will often connect with the tower and sector closest to it. This process is called "historical cell-site location analysis." Historical cell-site location analysis should not be confused with Global Positioning Systems ("GPS") location or real-time triangulation, both of which can pinpoint the location of a phone.

CDRs can never state the location of a cell phone with any semblance of precision. Cell phones are always looking for the strongest, not the closest, signal. To state otherwise is abandoning the design of the system created by actual engineers, not the members of law enforcement that have been trained how to plot cell tower location on a map. Cellular companies have many reasons, typically concerning business activity and overall network performance, for collecting the information contained in CDRs. None of these reasons is to determine precise historical locations of the subscribers' cell phones. Law enforcement is the only entity that utilizes CDRs for that purpose. No scientific community accepts this method as a reliable means of determining the location of a cell phone.

Law enforcement attempts to suggest that historical cell site location analysis is similar to GPS or real-time triangulation. This suggestion is entirely misleading, as historical cell site location information is exponentially less reliable and accurate.

GPS technology was invented by the Department of Defense specifically for the purpose of providing exceptionally reliable location information. *See* Giannelli, *supra*. "GPS is a system of 30+ navigation satellites circling Earth. We know where they are because they constantly send out signals. A GPS receiver in your phone listens for these signals. Once the receiver calculates its distance from four or more GPS satellites, it can figure out where you are." NASA, *How Does GPS Work?* located at: https://spaceplace.nasa.gov/gps/en/ (last accessed May 5, 2021). GPS has the highest potential accuracy of the various methods for determining a cell phone's location. As NASA details:

GPS is a system. It's made up of three parts: satellites, ground stations, and receivers. Satellites act like the stars in constellations—we know where they are supposed to be at any given time. The ground stations use radar to make sure they are actually where we think they are. A receiver, like you might find in your phone or in your parents car, is constantly listening for a signal from these satellites. The receiver figures out how far away they are from some of them. Once the receiver calculates its distance from four or more satellites, it knows exactly where you are. From miles up in space your location on the ground can be determined with incredible precision! They can usually determine where you are within a few yards of your actual location. More high-tech receivers, though, can figure out where you are to within a few inches.

Id. The use of historical cell site location information in criminal prosecutions by law enforcement and/or prosecuting agencies is a subterfuge to supplant GPS information with data from CDRs.

Real-time triangulation is another process by which multiple cell towers are used to locate a cell phone within range of all the towers at the same time. Real-time triangulation is much more precise than historical cell site location information, as it is utilizing three independent towers simultaneously to locate a cell phone. However, it too has its issues with precisely pinpointing a cell phone's location:

Using cell towers to detect location is not as accurate as GPS. Locating a mobile phone based on a single cell tower can place the mobile phone in a broad area, but it cannot pinpoint it. As the phone connects to more towers, the accuracy improves. By using cell tower triangulation (3 towers), it is possible to determine a phone

location to within an area of about ¾ square mile. In densely populated urban areas, the cell towers are close together, and a much closer estimation of phone location can be made than in a rural area, where the towers are far apart. If the nearest cell tower is busy, the cell signal would be picked up by the next nearest tower which could decrease location accuracy to beyond ¾ square mile or 30 meters of that cell tower.

FCC. 911 SMS Accurate Location Detection Help located App, at: https://transition.fcc.gov/pshs/911/Apps%20Wrkshp%202015/911_Help_SMS_WhitePaper0515 .pdf. (last accessed on May 5, 2021). In sum, law enforcement continually employs the least reliable methodology in attempting to hypothesize the specific location of a cell phone at a given time. This has resulted in noteworthy wrongful convictions, such as the case of Lisa Marie Roberts. See Tom Jackman, Experts say law enforcement's use of cellphone records can be Washington Post (June 27, 2014), located inaccurate, at: https://www.washingtonpost.com/local/experts-say-law-enforcements-use-of-cellphone-recordscan-be-inaccurate/2014/06/27/028be93c-faf3-11e3-932c-0a55b81f48ce_story.html (last accessed May 5, 2021).

Lastly, it is possible for an expert to validate the typical mapping conducted during historical cell-site analysis by conducting certain tests and collecting records to determine the actual reach of a particular tower and sector on a given time and date. These analyses include topographic analysis to determine whether there are any natural obstructions in an area, validating the actual geographic locations of cell sites by visiting the sites, researching network maintenance logs to determine if there were outages at a given time, conducting drive test analyses to map the actual range of a given cell tower after the fact, and several other methods. John B. Minor, Forensic Cell Site Analysis: A Validation & Error Mitigation Methodology, Journal of Digital Forensics Security and Law, Volume 11, Number 2 (2017) 33, 36. (attached as Exhibit F). The

authors of one recent study found the outcome of mapping analysis in 40 percent of cases changed after the validation techniques were performed, and in six percent of cases those changes were significant enough to impact the outcome of the case in terms of guilt and innocence. *Id.* at 45-46. In other words, simply plotting the towers used, without conducting any validation of the location or range of a given tower and sector, can and does lead to erroneous conclusions about a phone's locations.

Nevertheless, these types of validation remain rare in litigation. The same study analyzed 100 criminal and civil cases and determined that no validation was conducted in the vast majority of cases in which cell-site location evidence was offered. *Id.* at 36. None of the methods for testing reliability were employed in this case, further casting doubt as to how the government can sustain its burden under the *Daubert* test.Because of the potential error rate without validation, where no validation has been conducted, an expert's testimony necessarily carries certain caveats: an expert cannot precisely conclude with any degree of certainty how close to a given tower a phone was located when it connected with the tower or which tower would provide coverage to any particular location.

Courts have usually allowed some form of expert testimony regarding historical cell-site location information relating to data from CDRs under the *Daubert*/Rule 702 framework. *United States v. Jones*, 918 F. Supp. 2d 1, 4–6 (D.D.C. 2013) (collecting cases). This practice should be of great concern to this Court considering the wealth of contemporary information casting significant doubt on the reliability of this information used for the purposes of hypothesizing where a cell phone *might* have been located at a given date and time. Again, CDRs can never be used to precisely determine the location of a phone. This concern has been often overlooked by courts, as many defense attorneys have not levied appropriate challenges to the admission of historical cell

site location information. However, in spite of the failings of many within the defense community, some courts have limited experts' testimony to ensure that they do not make statements of certainty concerning a phone's location or overstate the significance of cell-site location analysis that has not been validated. *See Medley*, 312 F. Supp. 3d at 499 (citing *United States v. Hill*, 818 F.3d 289, 299 (7th Cir. 2016)); *United States v. Evans*, 892 F. Supp. 2d 949, 956 (N.D. Ill. 2012)).

In *Medley*, the court balanced the value of properly analyzed cell-site location information with the risk that a jury would "overestimate the quality of the information provided by this analysis." 312 F. Supp. 3d at 499. The court therefore held that the government's proffered expert could testify as follows:

I will allow the Government to elicit the opinion from [its expert] that the location of the defendant's cell phone was "consistent with" the location of the crime scene at the time of the carjacking, he may not do so until after he has fully explained during direct examination the inherent limitations of the accuracy of his location evidence—namely, the phone can only be placed in the general area of the cell tower sector that it connected to near the time of the carjacking, and that it cannot be placed any more specifically within that sector. During cross examination, the defendant will be allowed to cross examine [the government's expert] regarding the limitations of the location evidence that he can offer, based on the historical cell call records. As part of this examination, the defendant will be allowed to use any learned treatises regarding the limitations of using historical cell tower billing records to identify the location of a cell phone that are admissible under Fed. R. Evid. 803(18), consistent with the requirements of that rule (the learned treatise content may be read to the jury, but not admitted as an exhibit).

Id. This limitation on the expert's testimony allowed the jury to make a better determination of the true merits of historical cell site location information as a means of locating a specific cell phone.

Most recently, Judge Rakoff in the Southern District of New York excluded expert testimony regarding historical cell site location information. Judge Rakoff precluded the

government from proffering any expert testimony on the subject. Applying the principles of *Daubert*, thus holding the government to its burden, Judge Rakoff held:

Not being a scientist or an engineer, Mr. Donaldson was not able to give a detailed account of the scientific methodology underlying his opinion that the interaction with certain cell-towers of two cellphones allegedly associated with Mr. Polanco shows that on February 5, 2019, between 6:00 p.m. and 9:00 p.m., Mr. Polanco was nearby where Mr. Carela was allegedly assaulted by Mr. Nieves. However, despite the *Daubert*-like deficiencies, if Mr. Donaldson's testimony were more relevant than it is, the Court might have permitted it, subject to requiring that it be qualified by various statements that would reveal its limitations

Id. The testimony was ultimately excluded on relevance grounds, which is akin to the language of Rule 702 when it states, "the whether expert testimony proffered in the case is sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute." Fed. R. Evid. 702.

III. The Government Intends to Offer Expert Opinions as to Historical Cell-site Location Analysis.

Mr. Davis is charged by a three-count indictment. ECF No. 1. Count 1 alleges carjacking resulting in death on September 25, 2018, in violation of 18 U.S.C. § 2119(3). Count 2 alleges a conspiracy that began on September 25, 2018, to possess with intent to distribute a detectable amount of promethazine hydrochloride with codeine phosphate and marijuana, in violation of 21 U.S.C. § 846. Count 3 alleges the use, carry and discharge of a firearm on September 25, 2018, that resulted in death during and in relation to a crime of violence and drug trafficking offense, in violation of 18 U.S.C. §§ 924(c)(1)(A)(iii) and 924(j)(1).

The government's case rests largely on two main pieces of evidence: 1) Mr. Davis's DNA allegedly being recovered from the inside of a vehicle belonging to Mr. Raynor; and 2) historical cell-site location information evidence that the government intends to suggest places Mr. Davis in

proximity to when and where the death at issue occurred. No other forensic evidence, direct witness testimony, or video surveillance connects Mr. Davis to the offense at issue.

The government will seek to introduce the historical cell-site evidence and analysis through FBI Special Agent Mathew J. Wilde. a special agent with the Federal Bureau of Investigation. *See* Exhibit D, Government's expert disclosure letter, dated January 27, 2021; *see also* Exhibit B, *Curriculum Vitae* of Mathew J. Wilde. Along with its disclosure of Special Agent Wilde as their proffered expert, the government produced a PDF format, FBI CAST report created by Special Agent Wilde. Special Agent Wilde's report consists of five slides and includes eighteen demonstrative maps that show the geographic region within which the charged incident allegedly occurred. *See* Exhibit A.

Special Agent Wilde's CAST report relies on CDRs from Sprint for the subscriber account the government alleges was used by Mr. Davis, phone number (443) 694-0725, for the time period of September 25-26, 2018. *Id.* These materials indicate that the government, through Special Agent Wilde's testimony and report, will proffer his testimony to hypothesize Mr. Davis's physical location(s) during dates and times of specific importance to the alleged crime. Specifically, the government states the generic opinion Special Agent Wilde intends to offer:

Special Agent Wilde will be qualified as an expert in the analysis of cellular telephone location information, including cell site/tower location information and GPS latitude and longitude location information. He will testify regarding the locations of the cellular telephones with call numbers (443)-694-0725, belonging to Collin Davis, and (410)-855-2369, belonging to Anthony Raynor, on the day of Raynor's murder on September 25, 2018. The data for these numbers was previously produced in discovery and SA Wilde will discuss how he used the date to create a report. A draft of this report is attached and produced as R-CAST-0001 to R-CAST- 0023. SA Wilde anticipates a final report to be done next week, which we will send immediately upon receipt. Again, we appreciate your patience.

Special Agent Wilde will testify both as an expert witness and as a summary witness pursuant to Federal Rule of Evidence 10006 regarding the cellphone records previously produced to you. Special Agent Wilde's CV is enclosed.

See Exhibit D. Neither the disclosure letter nor the CAST report describe Special Agent Wilde's methodology in arriving at these opinions. Likewise, they do not state whether Special Agent Wilde conducted any validating tests to arrive at his opinions.

Federal Rule of Criminal Procedure 16(a)(1)(G) requires the government to provide a summary of any expert testimony it intends to use and must describe the witness's opinions, the bases and reasons for those opinions, and the witness's qualifications. That summary "must describe the witness's opinions, the bases and reasons for those opinions, and the witness's qualifications." *Id.* The government has failed to provide enough specificity within its disclosure because it includes no reasoning, methodology, or explanation for Special Agent Wilde's opinions.

ARGUMENT

The proffered prospective testimony of Special Agent Wilde should be precluded in its entirety. Special Agent Wilde's opinions and related demonstrative exhibits are not based on any discernable methodology. The proposed opinions included within the government's expert disclosures therefore run afoul of the mandates imposed under Federal Rule of Evidence 702, Federal Rule of Evidence 403, and the Supreme Court's ruling in *Daubert v. Merrell Dow Pharmaceuticals*.

Should this Court be inclined to permit Special Agent Wilde to testify as an expert, this Court should limit Special Agent Wilde's testimony in three ways: 1) the Court should preclude Special Agent Wilde from opining on Mr. Davis's location rather than the location of the phone; 2) the Court should preclude the government from relying on Special Agent Wilde's proffered demonstrative exhibits, which include incomplete and misleading information; and 3) the Court should impose the limitations imposed on a similar witness in *United States v. Medley*, 312 F. Supp. 3d 493, 503 (D. Md. 2018).

I. Special Agent Wilde's Proposed Opinions Violate Rule 702 and *Daubert*.

The government's proposed cell-site expert opinion from Special Agent Wilde is unsupported by any indicia of reliable and validated methodology, thus making it insufficiently reliable to be admitted under Federal Rule of Evidence 702. The government has not provided any suggestion of the scientific methodology underlying his opinion that the interaction with certain cell-towers confirms that the phone was nearby where the alleged crime took place. *Id.* Additionally, the testimony of Special Agent Wilde that Mr. Davis was within an impossible to define area that could span dozens of square miles during the commission of the crimes underlying this case is of "very modest relevance at best." *See United States v. Nieves*, Case No. JSR-19-354 (SDNY Apr. 19, 2021); 2021 WL 1535338. Accordingly, this Court should exclude or limit the opinion of Special Agent Wilde to more closely comport with the available data compiled from the CDRs belonging to (443) 694-0725.

Federal Rule of Evidence 702 provides that a witness who is qualified as an expert may testify in the form of an opinion when:

(1) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (2) the testimony is based on sufficient facts or data; (3) the testimony is the product of reliable principles and methods; and (4) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702. In assessing the reliability of an expert's methodology, the *Daubert* Court set forth five factors to consider: (1) whether the theory is based on scientific or other specialized knowledge that has been or can be tested; (2) whether the theory has been subjected to peer review; (3) the known or potential rate of error; (4) the existence of standards controlling the theory's operation; and (5) the extent to which the theory is generally accepted in the relevant community. *Daubert*, 509 U.S. at 593-94. A district court must make a preliminary assessment of "whether the reasoning or methodology underlying the testimony is scientifically valid and whether that

reasoning or methodology properly can be applied to the facts at issue." *Id.* at 592-93. The proponent of the expert testimony at issue must satisfy the burden of proving that the proffered testimony meets these requirements. Here, the government has failed to meet that burden with Special Agent Wilde's proposed opinion.

The government has provided no semblance of a reliable methodology to support the hypothesis of Special Agent Wilde that an approximate location the cell phone (443) 694-0725 can be reasonably determined with any true specificity. In attempting to approximate a location, Special Agent Wilde would be forced to pile assumption on top of assumption, all of which are favorable to the conclusion the government is clearly looking for in proffering this evidence: placing the subject phone associated with Collin Davis within a proximate location of the alleged crime. As stated earlier, cell phones seek the strongest signal, not the closest. Despite law enforcement experts regularly inferring to juries that cell phones connect to the nearest tower uniformly, this is simply not based in fact or according to the stated design of cell phone or cellular networks such as the one designed by Sprint, the network provider for (443) 694-0725. *See* Paul Giannelli et al., Scientific Evidence, § 25.09 (Matthew Bender ed., 5th ed. 2017); *see also* Exhibit C; Starr *supra*.

Finally, but of no less concern, there is no indication that Special Agent Wilde ever conducted any validating tests to determine whether the phone in question (443-694-0725) could have communicated with all of the relevant towers notated within his CAST report. Drive tests are utilized to measure signal strength and coverage area. Without such a test, another assumption about the potential coverage area of a tower is lumped into the *ipse dixit* analysis conducted by

Special Agent Wilde.⁴ Furthermore, no peer review was conducted of his adherence to specific methodologies. Special Agent Wilde makes no reference to learned treatises or scientific/technical publications relied upon in reaching his hypothesis as to the location of the cell phone at issue. No controlling standards of the methodology relied upon by Special Agent Wilde is ever referenced or notated. There is no error rate notated. Certainly the government and law enforcement is not asserting that this methodology or cellular networks/cell phones are infallible. Finally, there is no existence of a scientific or technical community (aside from law enforcement experts attempting to introduce this overpromising testimony) that recognizes using CDRs as a means to accurately and reliably locate a particular cell phone within a network.

Without more provided by the government, the proposed opinion of Special Agent Wilde relies on an unsubstantiated and unreliable methodology that lacks scientific validation, in violation of Rule 702. Specifically, the testimony cannot be based on sufficient facts or data and/or the testimony cannot be the product of reliable principles and methods. *See* Fed. R. Evid. 702; *see also Daubert*, 509 U.S. 579. Under Rule 104(a), this Court must determine as a threshold matter that the expert's testimony will be based upon sufficient facts. This is a safeguard to "insure that experts do not simply offer opinions that are conclusory. To allow otherwise is to permit speculation, which is not 'helpful' to the factfinder, and therefore not appropriate for testimony under Rule 702." Hon. Joseph F. Murphy, Jr. & Hon. Paul W. Grimm, Murphy & Grimm's Comparative Guide to the Maryland & Federal Rules of Evidence p. 242 (2007).

⁴ "Drive Test boasts both a library of historical benchmarking data and impressive nationwide coverage data. This yields both broad and local insights that aren't available elsewhere. Nielsen completes hundreds of drive tests every year using its fleet of vans equipped with state-of- the-art measurement tools. Drive Test's street-level analyses helps wireless carriers monitor and improve their networks at an exceedingly local and granular level." "Nielson, *Drive Test: Measuring Network Performance*, located at: https://www.nielsen.com/us/en/solutions/capabilities/drive-test/. (last accessed May 5, 2021).

II. The Proposed Opinion of Special Agent Wilde Should Be Excluded Under Rule 403.

Rule 403 excludes expert testimony if "its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." Fed. R. Evid. 403. Expert testimony has a heightened risk of violating Rule 403 because of the difficulty of laypersons to evaluate the testimony, leaving the jury vulnerable to being misled by unsupported inferences and the inevitable credibility given to "experts" qualified as such by a district court. *See Daubert*, 509 U.S. at 595. It is precisely this risk that necessitates this Court weigh the questionable probative value of Special Agent Wilde's proposed testimony, specifically his proposed opinion (or lack thereof) in the government's disclosures and demonstratives included in his report, with the substantial risk of unfair prejudice to Mr. Davis's defense. *Id*.

As referenced earlier, any proffered evidence, whether expert testimony or otherwise, must pass the requirements of Rule 403. *See* Fed. R. Evid. 403. U.S. District Court Judge Jed S. Rakoff of the Southern District of New York recently excluded expert testimony regarding historical cell-site location information analysis. After a full *Daubert* hearing, Judge Rakoff stated that "despite the *Daubert*-like deficiencies, if the (sic) testimony were more relevant than it is, the Court might have permitted it, subject to requiring that it be qualified by various statements that would reveal its limitations." *Nieves*, 2021 WL 1535338 at 1. The deficiencies referenced by Judge Rakoff of great concern included:

Not being a scientist or an engineer, Mr. Donaldson was not able to give a detailed account of the scientific methodology underlying his opinion that the interaction with certain cell-towers of two cell phones allegedly associated with Mr. Polanco shows that . . . Mr. Polanco was nearby where Mr. Carela was allegedly assault by Mr. Nieves.

Id. Ultimately, however, Judge Rakoff excluded the evidence pursuant to Rule 403 because:

[T]he fact that Mr. Polanco was in the same general vicinity around the time when Mr. Carela was allegedly assaulted by Mr. Nieves is over very modest relevance at best and, rather, invites ungrounded speculation and confusion. Moreover, dressing up this evidence of very limited relevance in the guise of an expert opinion gives it a prominence that only invites further confusion and prejudice.

Id. Here, the government is proffering an expert that is neither a scientist nor an engineer. The government, as well as the CAST report created by Special Agent Wilde fail to give a detailed account of the scientific methodology underlying his ability to reliably hypothesize that the interaction with specific cell towers and (443) 694-0725 establishes that Mr. Davis was nearby where the alleged crimes in this case took place. Allowing such unfettered testimony is the exact "dressing up of evidence" that concerned Judge Rakoff and ultimately proved dispositive in his decision to exclude the testimony in its entirety as more prejudicial than probative. Id.

A. Special Agent Wilde's proposed opinion is based upon unsubstantiated assumptions, rendering it more prejudicial than probative.

As a preliminary matter, it appears the government assumes that a cellular telephone call must necessarily utilize the nearest cell site and that the cellular telephone either making or receiving a call was located within a certain geographic range. It is well settled and established earlier that this is a false assumption, the brand of which is prohibited in any analysis under *Daubert* and its progeny. As stated above, "[n]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert. *Kumho Tire*, 526 U.S. at 158 ((citing *Joiner*, 522 U.S. at 146.

The government has provided no basis or methodology for this theory. Without providing any support, the location of the cell site that interacted with the cellular telephone at issue (443-694-0725), especially in comparison to the location of the alleged incident, is irrelevant. The

government must demonstrate that this is how cellular telephones and cellular networks operate. Nothing in its disclosure letter or in Special Agent Wilde's report provide any detail regarding how the evidence is relevant or reliable. As such, the evidence is highly prejudicial as there is an unacceptably high risk that a jury of laypersons will assume that the nearest tower is always utilized by a cellular telephone. This unacceptably high risk of unfair prejudice to Mr. Davis's defense is exactly the kind of prejudice Rule 403 was designed to eliminate. *See Huskey v. Ethicon, Inc.*, 848 F.3d 151, 159 (4th Cir. 2017)(Rule 403 "allows a court to exclude relevant evidence when its probative value is substantially outweighed by a danger of one or more of the following . . . misleading the jury . . ."); *see also* Fed. R. Evid. 403.

B. Special Agent Wildes's CAST report contains demonstratives that are misleading to the jury and should be excluded.

Special Agent Wilde's report includes demonstratives showing the cell sites plotted on maps including the location of the alleged crime. *See* Exhibit A. Included within the demonstratives in Exhibit A on which he locations of importance in the instant matter are notated by a colored square-like box. *Id.* at 14. Based upon the distance scale provided in the demonstrative located on page 14 of Exhibit A, the symbols notating important locations in the narrative of the instant matter are shapes approximately one kilometer long and one kilometer wide. *Id.* This literally makes the locations, which are either private one-family residences or a license plate reader camera approximately one square kilometer in area.

This greatly exaggerates how large the actual locations are compared to the scale of the map of the corresponding area. When this proposed expert's testimony is being proffered to place the subject cell phone (443-694-0725) within close proximity to the important locations in this case, using a symbol exponentially larger than the actual locations lends unfair and misleading

"credibility" to expert testimony. Accordingly, this creates a very strong likelihood of impermissible inferences being drawn by a jury of laypersons.

If the jury is misled to believe the area depicted in this demonstratives is much smaller than it is in reality, the testimony of Special Agent Wilde is impermissibly bolstered. The purpose of Special Agent Wilde's testimony is to opine as to a general location of the cellular telephone alleged to belong to Mr. Davis. It logically follows that the smaller the area at issue appears, the more credible Special Agent Wilde's testimony will appear in regards to his ability to pinpoint the location of the cellular telephone at issue during the relevant time-period. This is the exact brand of testimonial evidence that Rule 403 was designed to prevent. The Court may exclude the government's proffered exhibits under Rule 403 if it finds that their probative value is outweighed by the risk they would mislead the jury. *See Huskey* 848 F.3d at 159; *see also* Fed. R. Evid. 403. Analyzing the case at bar, it is hard to conceive of a means by which Rule 403 does not bar the admission of the proffered demonstratives.

III. The Government's Expert Disclosure for Special Agent Wilde Fails to Meet the Requirements of Rule 16.

Federal Rule of Criminal Procedure 16(a)(1)(G) requires the government to provide a summary of any expert testimony it intends to use and must describe the witness's opinions, the bases and reasons for those opinions, and the witness's qualifications. Fed. R. Crim. P. 16. "Rule 16(a)(1)(G) 'is intended to minimize surprise that often results from unexpected expert testimony ... and to provide the opponent with a fair opportunity to test the merit of the expert's testimony through focused cross-examination." *United States v. Smith*, 701 F.3d 1002, 1007 (4th Cir. 2012) (quoting Fed.R.Crim.P. 16(a)(1)(G) advisory committee's note to 1993 amendment).

The government has failed to provide any specificity within its disclosure. As copied verbatim *supra*, the government's so-called expert disclosure in this case was quite limited. As

currently constituted, Special Agent Wilde's opinions, bases and reasons for those opinions, and a meaningful description of the testimony were never disclosed to defense counsel. There is no reasonable view that this disclosure comports with the mandates of Rule 16 concerning expert testimony.

Without more, it is likewise impossible for the defense to meaningfully prepare for Special Agent Wilde's testimony. The government has merely stated that Special Agent Wilde will testify to the locations of cellular telephones with call numbers (443) 694-0725 (allegedly belonging to Collin Davis) and (410) 855-2369 (belonging to Anthony Raynor on September 25, 2018). The purpose of expert disclosures has not been satisfied. No reasoning, methodology, or explanation exists in discovery or the disclosure describing his Special Agent Wilde's opinions or bases and reasons for those opinions. *See* Fed. R. Crim. P. 16. Thus, the Defense submits that the letter cannot be considered a proper expert disclosure as it lacks the required specificity of information under Rule 16(a)(1)(G). *See Smith*, 701 F.3d at 1007.

IV. Were This Court to Admit the Testimony of Special Agent Wilde, This Court Should Impose the Same Limitations on Special Agent Wilde's Testimony That the Court Imposed in *United States v. Medley*.

In the absence of a reliable methodology and a detailed accounting for how this methodology satisfies the requirements of *Daubert* and Rule 702, this Court should exclude the testimony of Special Agent Wilde in its entirety. However, should this Court admit this testimony, the Court should impose the same limitations that the court imposed in *United States v. Medley*, which ensured that the jury was told the limitation of what the historical cell-site location analysis showed and, thus, warned against the jury giving undue weight to the historical cell-site location evidence. Without such limitations, the government would be allowed to mislead the jury into thinking the historical cell-site analysis involved a level of precision that it lacks.

In *Medley*, Judge Grimm mitigated this risk by noting that cell-site location analysis can be probative, but that there are inherent limitations in the science and methodology. *Id.* at 503. The Court, therefore, required the government's expert to explain on direct examination the limitations of historical cell-site analysis, "namely, the phone can only be placed in the general area of the cell tower sector that it connected to near the time of the carjacking, and that it cannot be placed any more specifically within that sector." *Id.* The court also preemptively ruled that that defense counsel could cross examine the expert using learned treatises discussing the limitations of cell site location testimony. *Id.* Placing similar limitations on Special Agent Wilde's testimony would aid the jury in understanding the technical boundaries of historical cell-site data, a subject that is likely unfamiliar to most jurors, prevent misunderstanding of Special Agent Wilde's demonstrative exhibits, while attempting to prevent the jury from being misled into impermissibly bolstering the probative value of said testimony.

CONCLUSION

For the reasons set forth in this motion, Mr. Davis respectfully requests that this Court exclude the proposed expert opinion testimony of Special Agent Mathew J. Wilde or in the alternative limit the proposed opinions and exclude the misleading demonstratives included within Special Agent Wilde's report. Mr. Davis further requests a hearing on this matter to enable him a meaningful opportunity to demonstrate to the Court the necessity for the relief requested herein.

Respectfully submitted,

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